

- Maintaining adequate hydration and ensuring nutritional requirements are met.
- Remembering the acronym **C-O-L-D** when wearing clothing in cold weather
(**C**: Keep it **Clean**; **O**: avoid **Overheating**; **L**: wear clothing **Loose** and in **Layers**; **D**: keep clothing **Dry**).
- Training soldiers on the proper use of cold weather clothing.

Commanders and Unit NCOs are responsible for the health and safety of their troops by:

- Chills
- Immersion foot (trench foot)
- Snow Blindness
- Dehydration
- Carbon Monoxide Poisoning
- Frostbite
- Hypothermia

Soldiers are responsible for preventing individual cold injuries such as:

Cold-Weather Casualties and Injuries

General Guidance for all Cold-Weather Training

- Skin:** Cover exposed skin because it is more likely to develop frostbite. Avoid wet skin (common around the nose and mouth). Inspect hands, feet, face and ears frequently for signs of frostbite.
- Clothing:** Change into dry clothing at least daily and whenever clothing becomes wet. Wash and dry feet and put on dry socks at least twice daily.
- Nutrition:** Consume 4500 calories/day/soldier. This is equivalent to three meal packets in Meal-Cold Weather (MCW) or three to four MREs.
- Hydration:** Consume 3 to 6 Liters of liquid (canteens)/day/soldier. Warm, sweet drinks are useful for re-warming.
- Camouflage:** Consider not using camouflage below 32° F (not recommended below 10° F), because camouflage obscures detection of cold injuries.

These guidelines are generalized for worldwide use. Commanders of units with extensive extreme cold-weather training and specialized equipment may opt to use less conservative guidelines. Cold injury prevention is a command responsibility.

For additional copies contact U.S. Army Center for Health Promotion & Preventive Medicine Health Information Operations Division at 1-800-222-9698 or CHPPM-HealthInformationOperations@apg.amedd.army.mil. For electronic versions, see <http://chppm-www.apgea.army.mil/coldinjury>. Local reproduction is authorized



Wind Chill Temperature Table

Temperature it "feels like" when wind is blowing

Wind (mph)	Temperature (°F)															
Cal	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84

Frostbite Times ►

30 minutes

10 minutes

5 minutes

List of recommended preventive measures to decrease frostbite risk

Frostbite Risk (see Wind Chill Temperature Table above)

Low Freezing is possible below 32°, but unlikely	High Freezing could occur in 30 minutes	Severe Freezing could occur in 10 minutes	Extreme Freezing could occur in 5 minutes
Preventive Measures <ul style="list-style-type: none"> • Avoid sweating • Cover exposed skin if possible • Wear Vapor Barrier boots below 0° F 			
<ul style="list-style-type: none"> • Increase surveillance with self and buddy checks • Wear appropriate layers and wind protection for the work intensity 	<ul style="list-style-type: none"> • Wear ECWCS* or equivalent and wind protection including head, hands, feet and face • Provide warming facilities • Mandatory buddy checks every 20-30 minutes 	<ul style="list-style-type: none"> • Work groups of no less than 2 personnel • Stay active 	
		<ul style="list-style-type: none"> • Mandatory buddy checks every 10 minutes 	<ul style="list-style-type: none"> • Be ready to modify activities due to extreme risk • Keep task duration as short as possible

* Extended cold weather clothing system

Note: Wet skin could significantly decrease the time for frostbite to occur
Trench Foot can occur at any temperature - Always keep feet warm and dry

Cold-Weather Casualties and Injuries

Chilblain

Cause	<ul style="list-style-type: none"> Repeated exposure of exposed skin for prolonged periods from 20° - 60°F with high humidity (for those not acclimated to cold weather)
Symptoms	<ul style="list-style-type: none"> Swollen, red skin (or darkening of the skin in dark-skinned soldiers) Tender, hot skin, usually accompanied by itching
First-Aid	<ul style="list-style-type: none"> Warm affected area with direct body heat Do not massage or rub affected areas Do not wet the area or rub it with snow or ice Do not expose affected area to open fire, stove, or any other intense heat source
Prevention	<ul style="list-style-type: none"> Use contact gloves to handle all equipment; never use bare hands Use approved gloves to handle all fuel and POL* products In extreme cold environments, do not remove clothing immediately after heavy exertion (PT); wait until you are in a warmer location Never wear cotton clothing in cold-weather environments

Hypothermia

Cause	<ul style="list-style-type: none"> Prolonged cold exposure and body-heat loss. May occur at temperatures above freezing, especially when a person's skin or clothing is wet
Symptoms	<ul style="list-style-type: none"> Shivering may or may not be present Drowsiness, mental slowness, lack of coordination that could progress to unconsciousness, irregular heartbeat, and death
First-Aid	<ul style="list-style-type: none"> Get the soldier to a medical facility as soon as possible, because hypothermia is the most serious cold exposure medical emergency and can lead to death Never assume someone is dead until determined by medical authorities, even if a victim is cold and not breathing Remove wet clothing and wrap victim in blankets or a sleeping bag Place another person in sleeping bag as an additional heat source Minimize handling of the unconscious victim with a very low heartbeat so as to not induce a heart attack
Prevention	<ul style="list-style-type: none"> Never wear cotton clothing in cold weather environments Anticipate the need for warming areas for soldiers exposed to cold, wet conditions

Frostbite

Cause	<ul style="list-style-type: none"> Freezing of exposed skin, such as fingers, toes, ears, and other facial parts Exposure of skin to metal, extremely cool fuel and POL*, wind chill, and tight clothing, particularly boots
Symptoms	<ul style="list-style-type: none"> Numbness in affected area Tingling, blistered, swollen, or tender areas Pale, yellowish, waxy-looking skin (grayish in dark-skinned soldiers) Frozen tissue that feels wooden to the touch
First-Aid	<ul style="list-style-type: none"> Evacuate immediately, because frostbite can lead to amputation Start first-aid immediately. Warm affected area with direct body heat Do not thaw frozen areas if treatment will be delayed Do not massage or rub affected areas Do not wet the area or rub it with snow or ice Do not expose affected area to open fire, stove, or any other intense heat source
Prevention	<ul style="list-style-type: none"> Use contact gloves to handle all equipment; never use bare hands Use approved gloves to handle all fuel and POL products Never wear cotton clothing in cold-weather environments Keep face and ears covered and dry Keep socks clean and dry Avoid tight socks and boots

Immersion foot (trench foot)

Cause	<ul style="list-style-type: none"> Prolonged exposure of feet to wet conditions at 32° - 60°F. Inactivity and damp socks and boots (or tightly laced boots that impair circulation) speed onset and severity
Symptoms	<ul style="list-style-type: none"> Cold, numb feet may progress to hot w/shooting pains Swelling, redness, and bleeding
First-Aid	<ul style="list-style-type: none"> Get medical help immediately Rewarm feet by exposing them to warm air Do not allow victim to walk on injury Evacuate victim to a medical facility Do not massage, rub, moisten, or expose affected area to extreme heat
Prevention	<ul style="list-style-type: none"> Keep feet clean and dry; change wet or damp socks as soon as possible Wipe the inside of Vapor Barrier boots dry at least once per day, or more often as feet sweat Dry leather boots by stuffing with paper towels

Dehydration

Cause	<ul style="list-style-type: none"> Depletion of body fluids
Symptoms	<ul style="list-style-type: none"> Dizziness Weakness Blurred vision
First-Aid	<ul style="list-style-type: none"> Replace lost water. Water should be sipped, not gulped Get medical treatment
Prevention	<ul style="list-style-type: none"> Consume 3-6 quarts of water per day at a minimum

Snow Blindness

Cause	<ul style="list-style-type: none"> Burning of the cornea of the eye by exposure to intense UV rays of the sun in a snow-covered environment
Symptoms	<ul style="list-style-type: none"> Pain, red, watery or gritty feeling in the eyes
First-Aid	<ul style="list-style-type: none"> Rest in total darkness; bandage eyes with gauze Evacuate if no improvement within 24 hours
Prevention	<ul style="list-style-type: none"> Use sunglasses with side protection in a snow-covered environment Use improvised slit glasses if sunglasses are not available

Carbon Monoxide Poisoning

Cause	<ul style="list-style-type: none"> Replacement of oxygen with carbon monoxide in the blood stream from burning fuels without proper ventilation
Symptoms	<ul style="list-style-type: none"> Headache, confusion, dizziness, excessive yawning Cherry red lips and mouth (in light skinned individuals); grayish tint to lips and mouth (in dark skinned individuals) Unconsciousness
First-Aid	<ul style="list-style-type: none"> Move to fresh air CPR if needed Administer oxygen if available Evacuate
Prevention	<ul style="list-style-type: none"> Use only Army-approved heaters in sleeping areas and ensure that personnel are properly licensed to operate the heaters Never sleep in running vehicles Always post a fire guard when operating a heater in sleeping areas

* POL - petroleum, oil, lubricants